

ADDITIONS to the Article, of the Inequalities of the Surface of the Earth, vol. i. p. 228.

I.

Of the Height of Mountains.

WE remarked, p. 237, that the *highest mountains in the world are the Cordeliers of America, and especially that part of them which lies under the Equator, or between the Tropics.* Our mathematicians who were sent to Peru, as well as some other travellers, have measured the height of these mountains above the level of the South Sea. Some of them were measured geometrically, and others by the barometer, which, being subject to little variation in that climate, gives the heights nearly as exact as a geometrical measurement. The following are the results of their observations.

Heights of the most elevated Mountains of the Province of Quito in Peru.

Cota-catché, to the north of Quito	2570
Cayambé-orcou, under the Equator	3030
Pitchincha,	

Fathoms.

Fathoms.

Pitchincha, a volcano in 1539, 1577, and 1660	-	2430
Antifana, a volcano in 1590	-	3020
Sinchoulogoa, a volcano in 1660	-	2570
Illinica, supposed to be a volcano	-	2717
Coto-paxi, a volcano in 1533, 1742, and 1744	-	2950
Chinboraço, a volcano; the date of its eruption unknown	-	3220
Cargavi-raso, a volcano in 1698	-	2450
Tongouragoa, a volcano in 1641	-	2620
El-altan, one of the mountains called Coil-lanes	-	2730
Sanguai, a volcano which has burnt since the year 1728	-	2680

By comparing the heights of the mountains of South America with those of our Continent, we will perceive that, in general, they are one fourth part higher than the mountains of Europe, and that almost the whole of them have been and actually are volcano's. But even the highest mountains in the interior parts of Europe, Asia, and Africa, have been extinguished long beyond the record of history. It is true, that, in several of these last mountains, we evidently recognise the ancient existence of volcano's, as well by the black and burnt sides of precipices, as by the nature of the matters which surround them,

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and which extend along the ridges of the mountains. But, as these mountains are situated in the interior parts of Continents, and now very distant from the sea, the action of the subterraneous fires, which cannot produce great effects but by the shock of water, ceased after the seas retired. It is for this reason, that, in the Cordeliers, whose roots may be said to border upon the South Sea, most of the peaks are actual volcano's; while the volcano's of Auvergne, Vivarais, Languedoc, Germany, Switzerland, &c. in Europe, and those of Mount Ararat in Asia, and of Mount Atlas in Africa, have long been absolutely extinct.

The height at which vapours freeze is about 2400 fathoms in the Torrid Zone, and about 1500 in France. The tops of high mountains sometimes surpass this line from 800 to 900 fathoms, and all this space is covered with snow which never melts. The highest clouds rise not above 300 or 400 fathoms above these mountains, and consequently exceed the level of the sea about 3600 fathoms. Hence, if the mountains were still higher, we should see, in the Torrid Zone, a belt of snow commencing at 2400 fathoms above the level of the sea, and terminating at 3500 or 3600 fathoms, not on account of the cessation of the cold, which augments in proportion to the elevation, but because the vapours would not rise higher*.

* Mem. de l'Acad. des Sciences, année 1744.

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M. de Keralio, a learned philosopher, has collected the heights of the mountains in several countries, from the measurements of different persons.

In Greece, M. Bernoulli determined the height of Mount Olympus to be 1017 fathoms. Hence the snow cannot lie upon it perpetually; neither can snow lie constantly on Pelion in Thessaly, nor on Cathalylium and Cyllene; because the height of these mountains does not rise to the freezing degree. M. Bouguer assigns 2500 fathoms as the height of the Peak of Teneriff, the top of which is always covered with snow. Mount *Ætna*, the Norwegian Mountains, the Hemus, the Athos, the Atlas, the Caucasus, and several others, such as Mounts Ararat, Taurus, and Libanus, are perpetually covered with snow, near their summits.

Fathoms.

Pontoppidan informs us, that the highest mountains of Norway are	3000
<i>Note</i> , This measure, as well as the following, appears to be exaggerated.	
According to M. Brovallius, the highest mountains of Sweden are	2333
The following, according to the Memoirs of the Academy of Sciences, are the highest mountains of France.	
Le Cantal	984
Mount Ventoux	1036
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	Fathoms.
Le Canigon of the Pyrennees -	1441
Le Mouffec -	1253
Le Saint Barthélemy -	1184
The Mountain of Gold in Auvergne, an extinguished volcano -	1048
According to Mr. Needham, the height of the mountains of Savoy are,	
The Convent of St. Bernard -	1241
The Rock to the south of St. Bernard -	1274
Mount Serène -	1282
L'Allée Blanche -	1249
Mount Tourné -	1683
According to M. Facio de Duiller, Mount Blanc, or the Cursed Mountain, is	2213

It is certain, that the chief mountains of Switzerland are higher than those of France, Spain, Italy, and Germany. Several learned men have ascertained the height of these mountains.

The greatest part of these mountains, according to M. Mikhéli, as the Wetter-horn, the Schreck-horn, the Eigheß-Schneeberg, the Fisher-horn, the Stroubel, the Fourke, the Louk-marier, the Crispalt, the Mougile, the ridge of Baduts and Gottard, are from 2400 to 2750 fathoms above the level of the sea. But these measures, I suspect, are too high, especially as they exceed, by one half, those given by Cassini, Scheuthzer, and Mariotte, which may be estimated too low, but not to this extent. My suspicion is farther confirmed, by considering that, both in the

the cold and temperate regions, where the air is always troubled with storms, the barometer is subject to so great variations, that its results cannot be trusted.

II.

Of the Direction of Mountains.

IN vol. i. p. 240. I remarked, that *the direction of the great mountains of America is from north to south, and that those of the Old Continent run from west to east.* This last assertion requires to be modified; for though, at first sight, we may follow the mountains as far as China, by passing from the Pyrennees in Auvergne, to the Alps in Germany, and in Macedonia, to Caucasus and other mountains of Asia, as far as the Tartarian sea; and though Mount Atlas, in the same manner, appears to traverse the Continent of Africa from west to east, the middle of this vast peninsula may still consist of a chain of high mountains stretching from Mount Atlas to the Mountains of the Moon, and from these to the Cape of Good Hope: In this view, the middle of the Continent of Africa may be considered as consisting of mountains which run from north to south through its whole extent, like the mountains